

Finally, each piece of equipment requires a separate management interface, preventing network-wide visibility.

**[0005]** The issues above all combine to prevent delivery of revenue-generating, differentiated IP services to an increasingly demanding customer base.

**[0006]** Current network designs typically require a discrete piece of equipment for each network function to be performed. For example, an Enterprise will typically include network devices that interface with desktop computers and servers, and connect them to the Internet or other network. The network devices includes servers, switches, routers, bridges, firewalls, load balancers, packet shapers, etc. Managing this wide conglomeration of network devices requires a significant amount of time and vendor-specific expertise.

**[0007]** As network requirements expand and change, the need for specialized network services also changes. For example, repositioning a single network device within a network architecture disadvantageously necessitates both network downtime and a physical presence to make the changes. It is useful to examine a typical network configuration for an Enterprise to better understand the

problem.

**[0008]** Figure 1 is an illustration of a typical network topology 10 of the prior art. The interface between desktops 12 and servers 14 to a network, such as the Internet 16, typically includes network devices or components such as a router 18, a firewall 20, a packet shaper 22, and at least one switch, but where two switches 24, 26 are shown in this figure. Another server 28 might also be part of this interface, when the server is providing network services such as in an SQL server, DNS server, Web server, etc.

**[0009]** Each of the discrete components listed above is disposed within its own "box." Each box occupies a certain amount of space, or footprint. Furthermore, each box must also have its own power supply.

**[0010]** It would be an advantage over the state of the art to provide network administrators with a network architecture and system tools that would provide a consolidated, flexible, scalable, and less complex management solution that can be customized according to a customer's needs. Such a solution should enable network components, both the hardware and the software, to be

included from any vendor. It would also be an advantage to decrease the level of complexity of the solution such that management tasks can be performed by a person with limited computer network and vendor-specific knowledge.

5     **[0011]**     In order to assist the network administrator, it would also be an advantage to provide a plurality of pre-configured or "canned" network configurations. Thus, for relatively simple network configurations, the administrator would not even have to design the network topology, as long as the available network components matched the canned network configuration.

10     **[0012]**     It would also be an advantage over the prior art to provide a solution where the network configuration can be modified on the fly. The system should also be capable of enabling control of the system, if desired, down to single network port control, or sophisticated enough to manage all of the network ports as determined by network conditions.

15     **[0013]**     It would also be an advantage to provide a plurality of these systems such that they can be coupled together in a large network, be it the Internet, or in a more localized WAN or LAN topology. The system should